



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/730,461	12/05/2000	Hiroshi Kawai	P/1071-1207	8149

7590 05/06/2003
Keating & Bennett, LLp
10400 Eaton Place
Suite 312
Fairfax, VA 22030

EXAMINER

BELLAMY, TAMIKO D

ART UNIT	PAPER NUMBER
----------	--------------

2856

DATE MAILED: 05/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/730,461

Applicant(s)

KAWAI, HIROSHI

Examiner

Tamiko D. Bellamy

Art Unit

2856

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 31/2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-10, 12-13, and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (5,780,740).

With respect to claims 1, 3/1, 9, 10, 12, 13, 15, 19 and 20 Lee et al. discloses in Figs. 8A and 8B an inertial object 105 vibrating in orthogonal X and Z directions (col. 9, lines 25-37), and an excitation means 106, 110 for causing said vibrating body 105 to vibrate in the X-direction (col. 9, lines 21-31). Lee et al. discloses a detecting electrode for detecting a Z-direction vibration (col. 10, lines 7-16). Hence, Lee et al. discloses the detecting electrode may be a capacitive type (col. 7, line 56-57). Furthermore, Lee et al. discloses a stiffness controlling electrode 111 is disposed along the Z-axis (col. 9, lines 55-65). Hence, Lee et al. discloses the controlling electrode 111 can be installed independently or be replaced with a detecting electrode (col. 10, lines 13-16). The stiffness controlling electrode 111 is equivalent to an inhibiting means. With respect to further limitations of claims 1, 9, 10, 12, 13, 15, 19 and 20, Lee et al lacks the detail of a first and second conductive portion disposed on each side of a detecting electrode for

inhibiting deflection on the Z-direction, and converting the detecting electrode into a voltage (cls. 9, 15, 19 and 20). However, duplication and placement of a component is a design consideration clearly within the preview of one of ordinary skill in the art. It is well known in the art to convert the signals from a detection electrode to a voltage.

Therefore, it would have been obvious to one of ordinary skill in the art to provide Lee et al. with two controlling electrodes and a voltage converter, so that the device provides an enhanced damping means to prevent vibration in the Z-direction. The device including voltage converter provides a means further processing the signal.

With respect to claims 2 and 10, Lee et al. discloses in Figs. 8A and 8B calculating angular velocity around a Y-direction, and the Z- directional frequency is measured by a surface sensing electrode (col. 9, lines 25-34).

With respect to claims 4/1 and 5, Lee et al. discloses in Fig 8A an inertial object 105 vibrated in the X direction since springs 104 are connected to the substrate 101 (col. 9, lines 35-38).

With respect to claims 6-8, Lee et al. discloses in Figs. 6 and 8A, the Z-directional frequency is measured by a surface sensing electrode 66 disposed under the vibrating structure (col. 9, lines 31-34), and the detector 66 may be a capacitive type (col. 7, lines 56-57). With respect to further limitations of claim 8, Lee et al. discloses that the detection electrode is below the vibrating body. Therefore, by placing the detecting electrode 66 between inertial body 105 and the substrate 101, the space between elements 105 and 101 do form a cavity as claimed.

Art Unit: 2856

With respect to claim 16, Lee et al. discloses all of claim 16 including springs 104 that are equivalent to supporting beams. However, Lee et al. does not specifically disclose that the supporting beams are hook-claw shaped beams that contact the substrate exterior to the region defined by the vibrating body. As shown in figure 8A, the springs 104 are in a region exterior to the inertial object 105. Furthermore, the shape of an object is a design consideration clearly within the preview of one of ordinary skill in the art.

With respect to claims 17 and 18, Lee et al discloses employing a controlling electrode 111 can control the frequencies of the gyroscope. Hence, the voltage is changed until the Z-axis directional frequency comes within an allowable error range (col. 9, lines 55-64). Lee et al lacks the detail of a controlling the electrostatic forces provided by first and second conductive portions. The controlling electrode 111 is equivalent to a means of controlling the electrostatic forces detected by the detecting electrode. However, duplication of a component is a design consideration clearly within the preview of one of ordinary skill in the art. Therefore, it would have been obvious to one of ordinary skill in the art to provide Lee et al. with two controlling electrodes, so that the device provides an enhanced damping means to prevent vibration in the Z-direction.

3. Claims 11, 14, are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (5,780,740) in view of Yamashita et al. (5,952,572).

With respect to claims 11 and 14, Lee discloses all of the limitations of claims 11 and 14 except that the electrostatic capacity by the detecting electrode is converted to a voltage using a FET. Yamashita et al. discloses the capacitance change is detected by

Art Unit: 2856

converting in to a voltage change using a FET (col. 10, lines 40-56). It would have been obvious at the time the invention was made to a person having ordinary skill in the art to use to use Lee et al. according to the teachings of Yamashita et al., to test an angular velocity sensor including a FET as the system of Lee et al. would operate equally well on either tested structure. Evidence of this can be found in Lee et al. that disclose a detecting electrode for detecting a Z-direction vibration (col. 10, lines 7-16). Hence, Lee et al. discloses the detecting electrode may be a capacitive type (col. 7, line56-57).

Response to Remarks

4. Applicant's remarks filed on December 20, 2002 have been fully considered but they are not persuasive. Applicant argues the prior art do not teach two conductive portion with respect to the detecting portion. However, duplication of a component is a design consideration clearly within the preview of one of ordinary skill in the art. It is the examiners position that claims 1-10, 12-13, and 15-20 are not patentable over Lee et al. (5,780,740). Claims 11 and 14 are not patentable over Lee et al. (5,780,740) in view of Yamashita et al. (5,952,572).

5. Applicant's remarks, filed on December 20, 2002, with respect to claim 1 rejected under 102 (e) have been fully considered and are persuasive. The 102 (e) rejection of claim 1 has been withdrawn.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tamiko D. Bellamy whose telephone number is (703) 305-4971. The examiner can normally be reached on Monday through Friday 8:30 AM to 5:30PM.

Art Unit: 2856

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (703) 305-4705. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Tamiko Bellamy

T.B.

April 25, 2003

HELEN KROICK
PRIMARY EXAMINER

